Comparison of the quality of homogenized pork sausages and their plant-based counterparts available on Polish market

Aneta Cegielka, Anita Murawska, Marta Chmiel, Dorota Pietrzak

Warsaw University of Life Sciences - WULS SGGW, Poland

Objectives: This study compares some qualities of selected assortments of scalded homogenized pork sausages and non-meat products imitating homogenized sausages, which are available on Polish market. Eliminating meat and meat products from the diet is becoming more and more popular in Poland, therefore the assessment of the nutritional value and other quality features of meat imitating products seems justified.

Materials and Methods: The research material in this study consisted of six products, three of which were homogenized sausages, while the other three were plant-based analogues of this type of sausages. According to the producers' information, the basic raw material in homogenized sausages was pork, and in non-meat products - soy and wheat proteins. The content of selected chemical components in pork sausages (near-infrared reflectance transmission method) [Polish Standard 2010], NaCl water content in plant- based sausage analogs (drying method and potentiometric titration method, respectively), pH value, texture parameters (instrumental measurement of shear force, double compression test), color parameters (CIEL*a*b*colour scale) [CIE, 1986] and the sensory quality (sensory attributes: appearance of the product, consistency, colour on the cross section, flavor; five-point scale) of both product groups [Baryłko-Pikielna and Matuszewska, 2009]. The information contained on the packaging labels of all products was also analyzed in terms of European food law provisions [Regulation 2011]. Products from three different production batches were assessed.

Results and Discussion: Current eating habits mean that more and more people who do not eat meat are looking for products that resemble, at least in appearance and taste, products made of meat [Choudhury et al., 2020, Gadzała and Lesiów, 2019]. The obtained results showed that homogenized pork sausages and non-meat products imitating them differed in terms of all assessed quality features. These differences were most likely due to the type of primary raw material used in the production as well as the non-meat ingredients and food additives. Homogenized sausages were characterized by a relatively low water content (51.01-57.71%), and a high protein and fat content (12.14-13.92% and 23,63-31,87%, respectively). The non-meat products contained significantly ($P<0.05$) less NaCl than the sausages (1.37- 1.60% and 1.85-1.98%, respectively). According to the producers' declarations, the protein content in nonmeat sausage analogues ranged from 18.0% to 26.1%. Meat products were characterized by significantly ($P<0.05$) higher shear force values than meatless products (16.73-26.77% and 7.97-12.09%, respectively). Moreover, it was found that the value of the shear force for the sausages increased with the meat content in the recipe composition. Significant ($P<0.05$) differences between both groups of products were also found in hardness, gumminess, springiness and cohesiveness On the basis of the instrumental measurement of the color on the cross-section of the product bars, it was found that the color of the plantbased 'sausages' was significantly ($P<0.05$) darker than that of the pork sausages and the yellowness was higher. In sensory evaluation, non-meat products differed significantly ($P<0.05$) from pork sausages in terms of all assessed attributes, as evidenced by lower average scores. Similarly, the overall quality of homogenized sausages was assessed as significantly higher than that of non-meat products (4.2-4.7 points and 2.4-3.1 points, respectively). All assessed products were labeled correctly, i.e. in accordance with the requirements of food law in the EU.

Conclusions: Non-meat products available on Polish market imitate homogenized sausages with their appearance quite well and can be regarded as an alternative to their meat counterparts in terms of health value. They are characterized by a high protein content as well as a low fat and salt content. However, plant-based products do not fully match scalded homogenized sausages from pork in terms of sensory attributes other than appearance. Consumers purchase such products might be influenced by individual beliefs and/or current dietary trends.

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